

Appl. No.: 10/796,656
Amdt. dated 07/24/2006
Reply to Office action of March 22, 2006

Amendments to the Specification:

Please replace the title of the application with the following amended title:

COMPOSITION FOR FORMING A POROUS FILM PREPARED BY HYDROLYSIS AND
CONDENSATION OF AN ALKOXYSILANE USING A TRIALKYLMETHYLAMMONIUM
HYDROXIDE CATALYST

Please replace the paragraph beginning on page 5, line 23 and ending on page 6, line 7 with the
following amended paragraph:

After an effort to achieve the objects, the inventors ~~has~~ have found that
~~tetralkylammonium~~ tetralkylammonium hydroxide obtained by the electrolysis of quaternary
ammonium ~~carbonate~~ carbonate produced by the reaction between trialkylamine and dialkyl
carbonate, comprises reduced amounts of alogen and metallic impurities wherein boron is
counted in the metallic impurity, and is an excellent basic catalyst in the hydrolysis and
condensation reaction of alkoxyasilane to produce a silica composition imparting high hardness.
Then, they have completed the invention.

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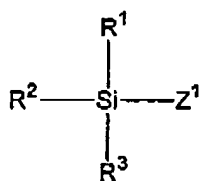
2. (Previously Presented) The composition for forming a porous film according to Claim 1 wherein the total carbon number of R^7 , R^8 and R^9 in said trialkylmethylammonium hydroxide is 4 to 15.

3. (Previously Presented) The composition for forming a porous film according to Claim 1 wherein said trialkylmethylammonium comprises a reaction product of trialkylamine and dimethyl carbonate.

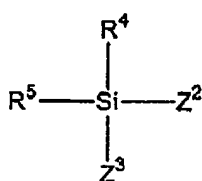
4. (Previously Presented) The composition for forming a porous film according to Claim 1, wherein said hydrolysis and condensation product of an alkoxysilane or the partial hydrolysis product of the alkoxysilane comprises a product having a weight-average molecular weight of 10,000 to 1,000,000.

5. (Previously Presented) A method for manufacturing a composition for forming a porous film, comprising hydrolysing and condensing an alkoxysilane or a partial hydrolysis product of the alkoxysilane in an organic solvent in the presence of trialkylmethylammonium hydroxide as a catalyst, wherein the alkoxysilane comprises one or more alkoxysilanes selected from the group consisting of compounds represented by formulae (1) to (4) below, and the trialkylmethylammonium hydroxide is represented by formula (5) below which is a reaction product of trialkylamine and dimethyl carbonate,

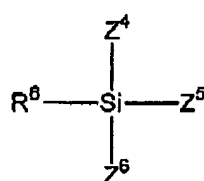
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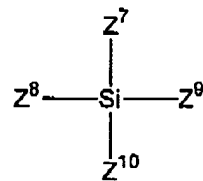
(1)



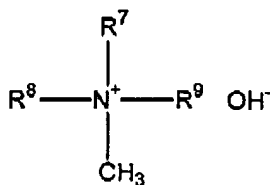
(2)



(3)



(4)



(5)

wherein Z^1 , Z^2 , Z^3 , Z^4 , Z^5 , Z^6 , Z^7 , Z^8 , Z^9 and Z^{10} each independently represents an alkoxy group having 1 to 6 carbons; R^1 , R^2 , R^3 , R^4 , R^5 and R^6 each independently represents a monovalent hydrocarbon group which is optionally substituted; and R^7 , R^8 and R^9 each independently represents an alkyl group having 1 to 6 carbons.

6. (Previously Presented) A method for manufacturing a porous film comprising applying a composition according to Claim 1 to a substrate to form a film thereon, drying the film and heating the dried film to produce a porous film.

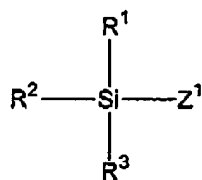
7. (Previously Presented) A porous film comprising a composition according to Claim 1.

8. (Previously Presented) An interlevel insulating film comprising a composition according to Claim 1.

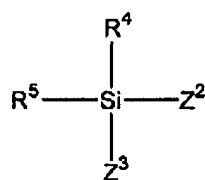
9. (Currently amended) A semiconductor device comprising a porous film therein, the porous film formed of a composition comprising ~~10ppm~~ 10 ppm or less halogen impurity and

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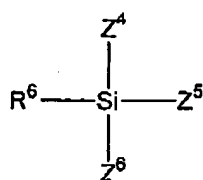
~~10ppb-100 ppb~~ or less metallic impurity where boron is counted in the metallic impurity, the composition comprising the hydrolysis and condensation product of an alkoxysilane or a partial hydrolysis product of the alkoxysilane in an organic solvent in the presence of trialkylmethylammonium hydroxide as a catalyst, wherein the alkoxysilane comprises one or more ~~alkoxysilanes~~ alkoxysilanes selected from the group consisting of compounds represented by formulae (1) to (4) below, and the trialkylmethylammonium hydroxide is represented by formula (5) below,



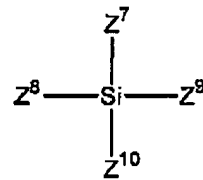
(1)



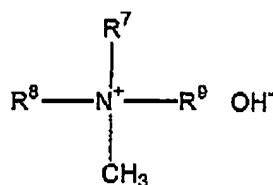
(2)



(3)



(4)



(5)

wherein $\text{Z}^1, \text{Z}^2, \text{Z}^3, \text{Z}^4, \text{Z}^5, \text{Z}^6, \text{Z}^7, \text{Z}^8, \text{Z}^9$ and Z^{10} each independently represents an alkoxy group having 1 to 6 carbons; $\text{R}^1, \text{R}^2, \text{R}^3, \text{R}^4, \text{R}^5$ and R^6 each independently represents a monovalent hydrocarbon group which is optionally substituted; and R^7, R^8 and R^9 each independently represents an alkyl group having 1 to 6 carbons.

10. (Previously Presented) The semiconductor device according to Claim 9 wherein the total carbon number of R^7, R^8 and R^9 in said trialkylmethylammonium hydroxide is 4 to 15.

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11. (Previously Presented) The semiconductor device according to Claim 9 wherein said trialkylmethylammonium hydroxide comprises a reaction product of trialkylamine and dimethyl carbonate.

12. (Previously Presented) The semiconductor device according to Claim 9 wherein said hydrolysis and condensation product of an alkoxysilane or the partial hydrolysis product of the alkoxysilane comprises a product having a weight-average molecular weight of 10,000 to 1,000,000.

13. (Previously Presented) The semiconductor device according to Claim 9 wherein said porous film is between metal interconnections in a same layer or multi-level interconnects, or is between upper and lower metal interconnection layers.